

COGNITIVE PROCESSES

Agenda

1. Quiz
2. Knowledge
 1. Conceptual knowledge
 2. Definitional, prototype and exemplar knowledge

Conceptual Knowledge

On the way home Kelly tripped and ended up dropping the ice cream and breaking a nail.

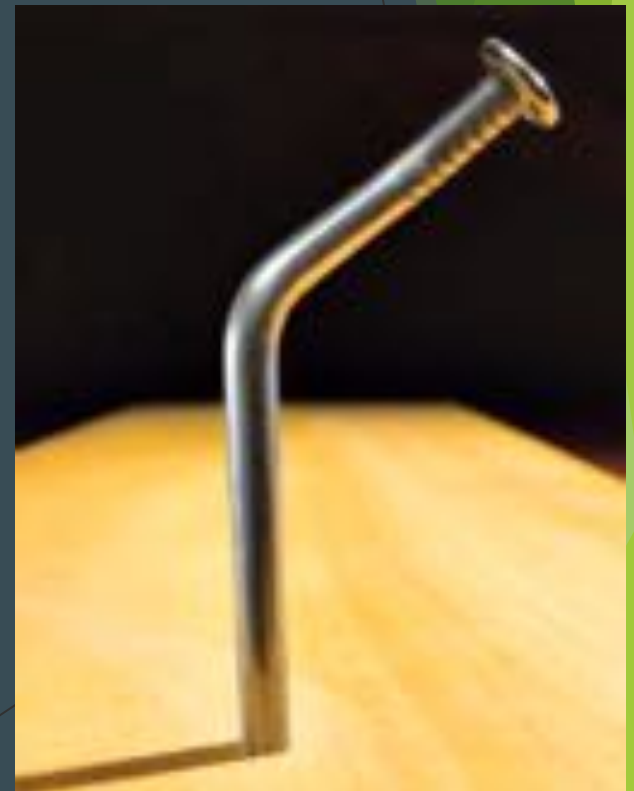
Conceptual Knowledge

*On the way home **Kelly** tripped and ended up dropping the ice cream and breaking a nail.*



Conceptual Knowledge

*On the way home Kelly tripped and ended up dropping the ice cream and breaking a **nail**.*



Conceptual Knowledge

On the way home Kelly tripped and ended up dropping the ice cream and breaking a nail.

- this simple sentence is informed by an astonishing amount of **conceptual knowledge**

Conceptual Knowledge

Conceptual knowledge: knowledge that enables us to recognize objects and events and to make inferences about their properties

Conceptual Knowledge

Conceptual knowledge: knowledge that enables us to recognize objects and events and to make inferences about their properties

- ▶ knowledge exists in the form of **concepts**
 - ▶ **Concepts** - mental representation or meaning of an object, event, or idea...

Conceptual Knowledge

Conceptual knowledge: knowledge that enables us to recognize objects and events and to make inferences about their properties

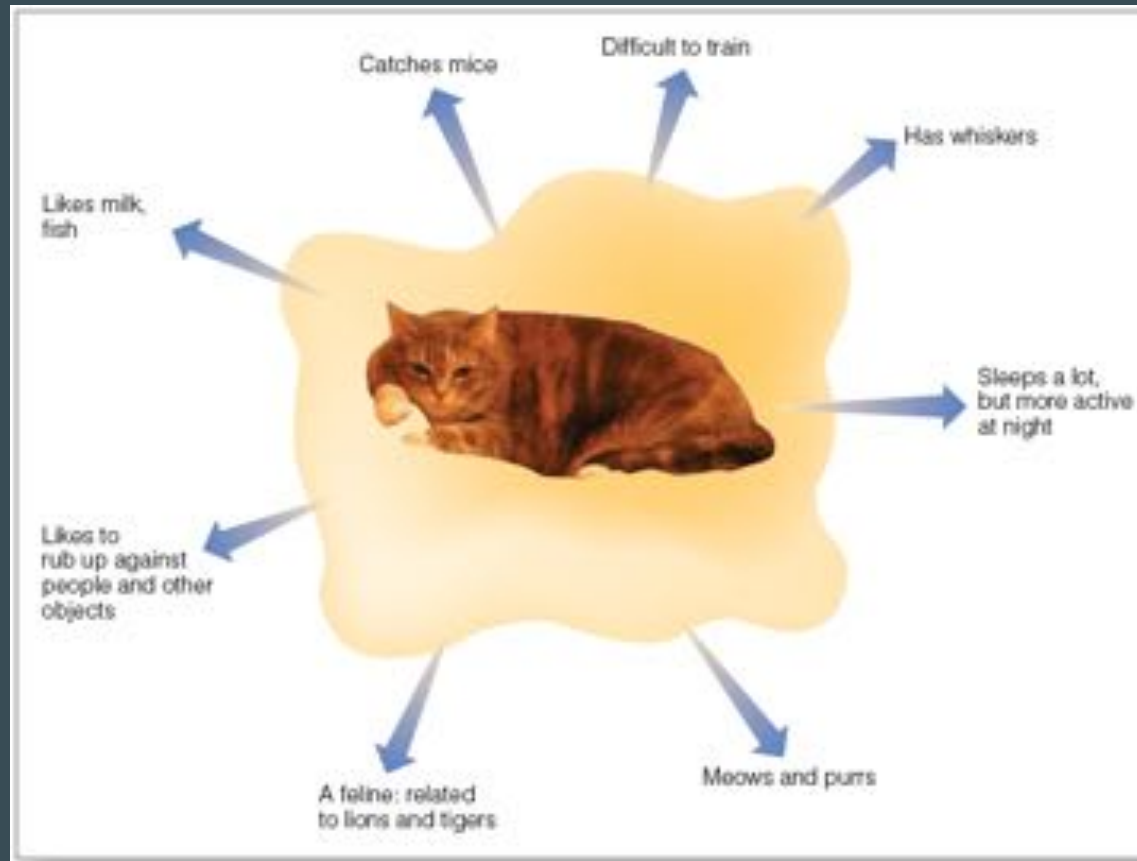
- ▶ knowledge exists in the form of **concepts**
- ▶ **categories** are all possible examples of a particular concept

Conceptual Knowledge



- categorization can occur automatically

Conceptual Knowledge



- ▶ knowing that something is in a category provides a great deal of information about it

Think, pair, share

**What is a bird? How do you know a bird
when you see one?**

Behavioral Approaches to Categorization

1. **Definitional approach**
2. Prototype approach
3. Exemplar approach

Definitional Approach

Definitional approach: determine category membership based on whether an item meets the definition of the category

Definitional Approach

- *What is the defining feature of fruit?*



Definitional Approach

- *What is the defining feature of fruit?*
 - contains seeds?



Definitional Approach

- ▶ *What is the defining feature of a bachelor?*

Definitional Approach

- unmarried + human + male?
- *What is the defining feature of a bachelor?*

Definitional Approach

- unmarried + human + male?

- *What is the defining feature of a bachelor?*

Jack is an unmarried male, but has been living with his girlfriend for ten years. Their relationship is stable and happy.

Charles is an unmarried male who does not have a partner. But Charles is a monk living in a monastery.

Zachary is an unmarried male, but he is two years old.

Frank is a married male, but has not seen his wife in many years. He dates often, hoping to find a new partner.

Definitional Approach

- ▶ **Problem #1:** some categories do not readily lend themselves to feature analysis

Definitional Approach

- ▶ **Problem #1:** some categories do not readily lend themselves to feature analysis

“I shall not today attempt to further define [pornography] ... but I know it when I see it...” Justice Potter Stewart



Definitional Approach

- ▶ **Problem #2:** a violation of defining features does not change the category

Definitional Approach

- **Problem #2:** a violation of defining features does not change the category

Birds can fly



Behavioral Approaches to Categorization

1. Definitional approach
2. **Prototype approach**
3. Exemplar approach

Prototype Approach

- **Family resemblance:** items in a category resemble one another in a number of ways



Prototype Approach

- **Family resemblance:** items in a category resemble one another in a number of ways



Prototype Approach

Prototype approach: determine category membership by comparing the item to a prototype that resembles the category

Prototype Approach

Prototype approach: determine category membership by comparing the item to a prototype that resembles the category

- ▶ **prototype:** “typical” member of a category

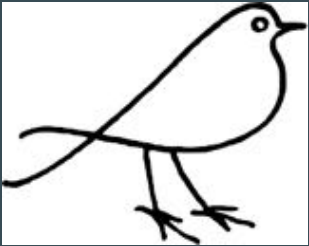


members of the “bird” category

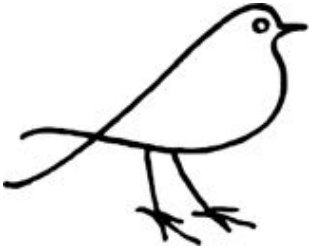


prototypical “bird”

Prototype Approach



Prototype Approach



prototype

flies

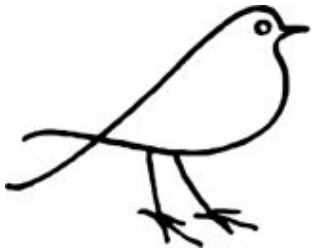
sings

lays eggs

small

nests in trees

Prototype Approach



prototype

wren

flies



sings



lays eggs



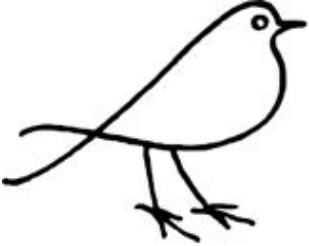


small





builds nests in trees



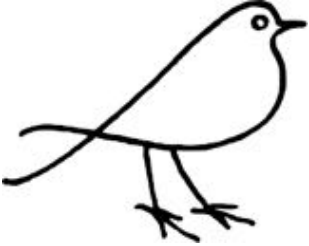

Prototype Approach

		
prototype	wren	heron
flies	✓	✓
sings	✓	✓
lays eggs	✓	✓
small	✓	
nests in trees	✓	

Prototype Approach

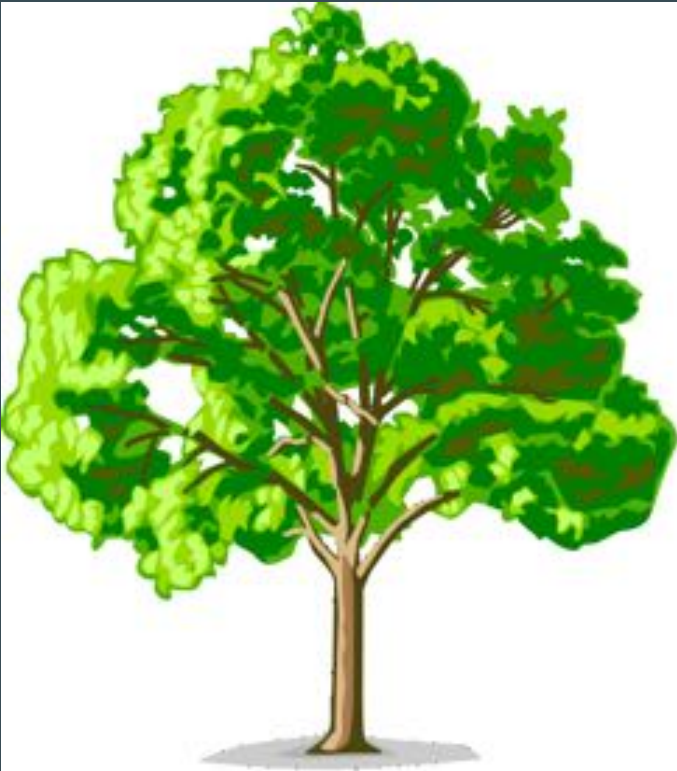
				
prototype	wren	heron	eagle	penguin
flies	✓	✓	✓	
sings	✓	✓		
lays eggs	✓	✓	✓	✓
small	✓			
nests in trees	✓			

Prototype Approach

				
prototype	wren	heron	eagle	alligator
flies	✓	✓	✓	
sings	✓	✓		
lays eggs	✓	✓	✓	✓
small	✓			
nests in trees	✓			

Prototype Approach

- **typicality:** how closely a category member resembles the category prototype



Prototype Approach

- **typicality:** how closely a category member resembles the category prototype

Basketball



Volleyball



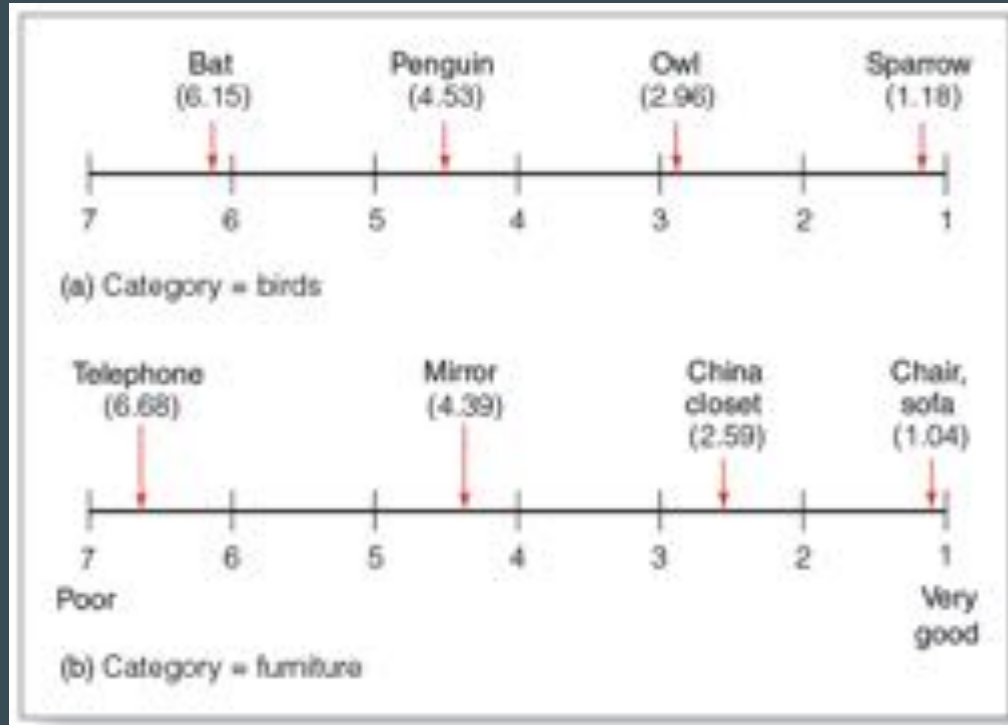
Skiing



Archery



Prototype Approach



- high typicality members are rated as being more representative of the category

Prototype Approach

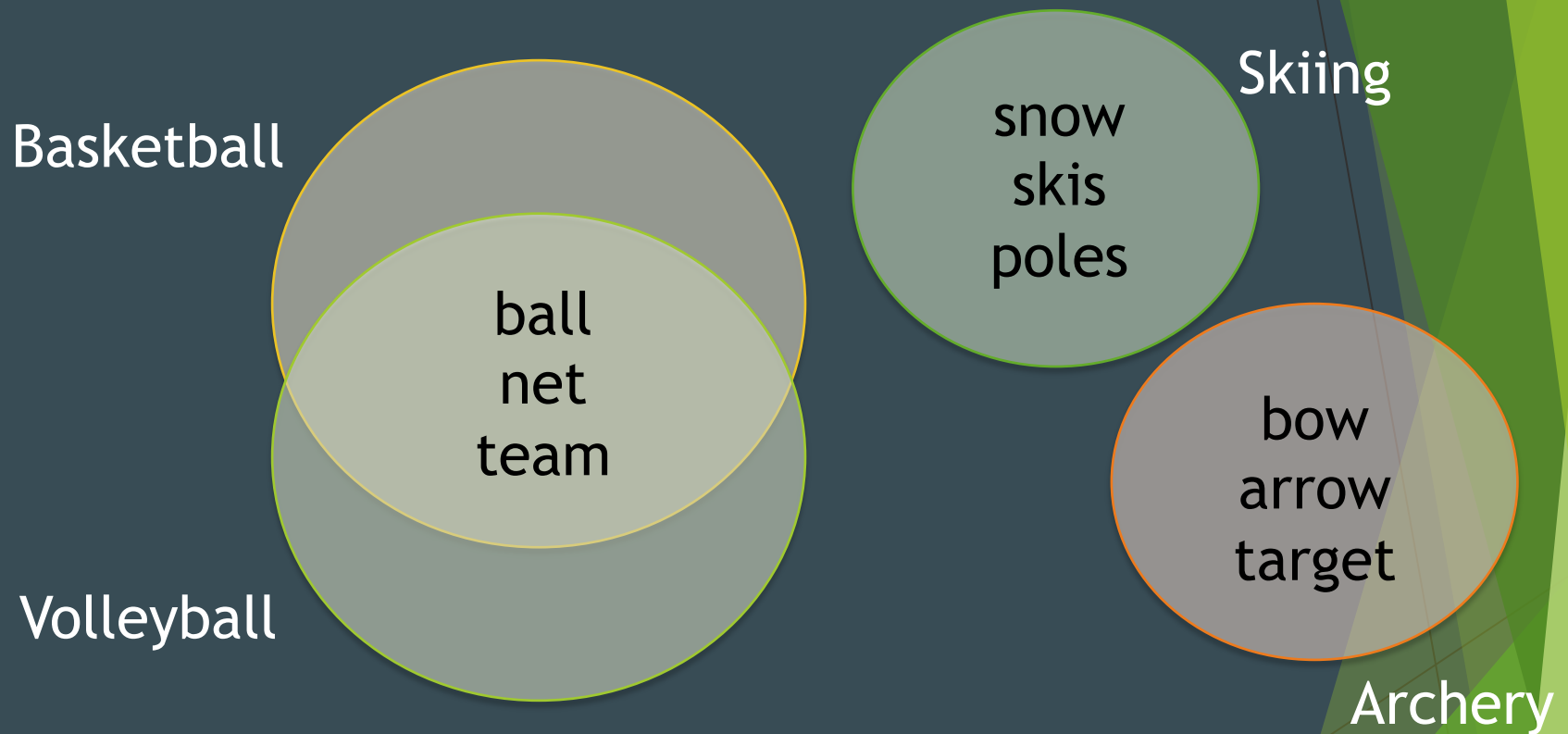
name a
sport



basketball

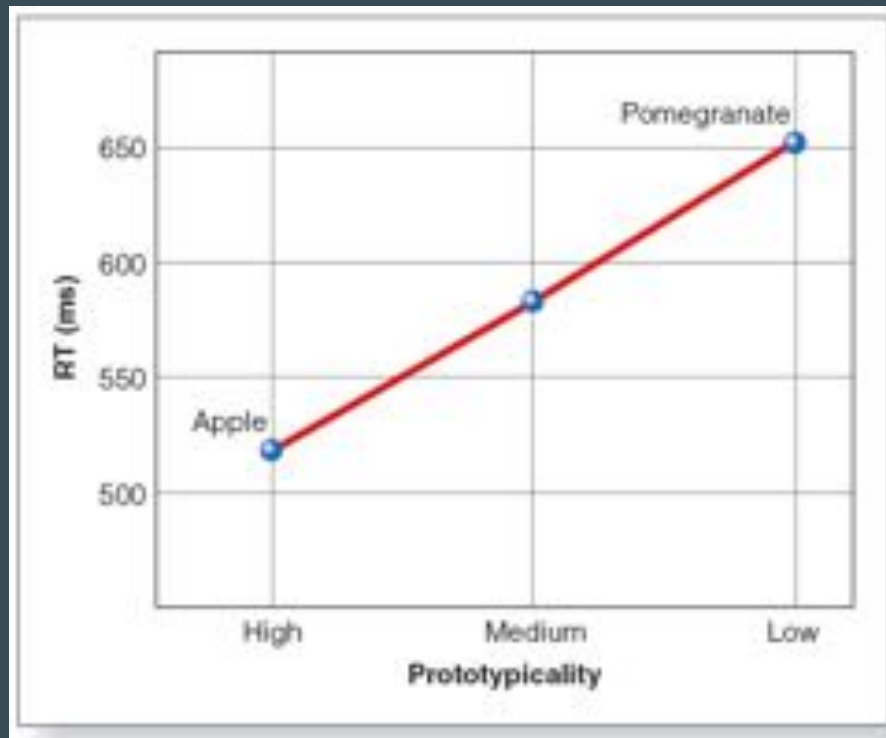
- high typicality members are **named first** within the category

Prototype Approach



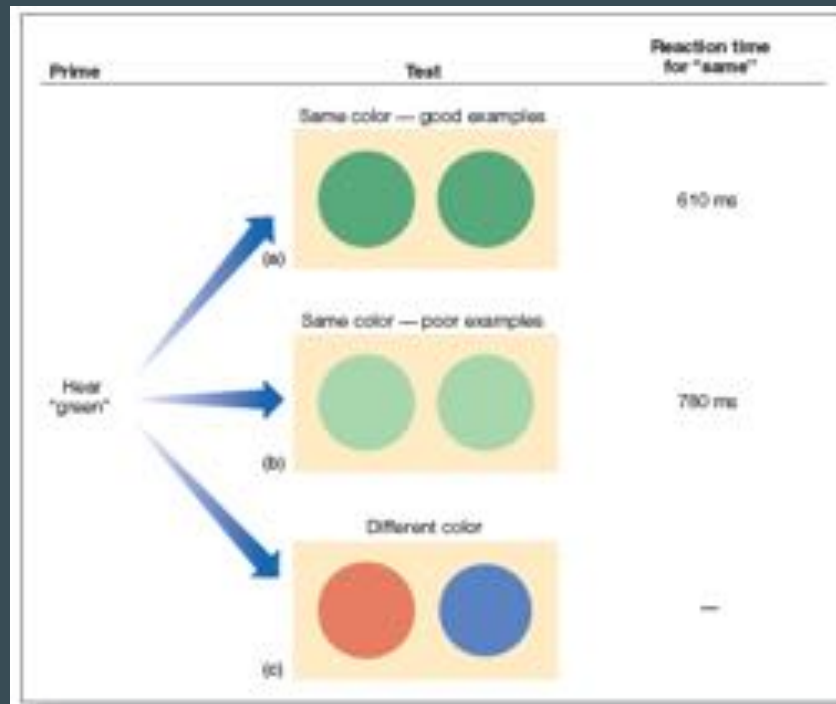
- high typicality members have more overlapping characteristics of the category

Prototype Approach



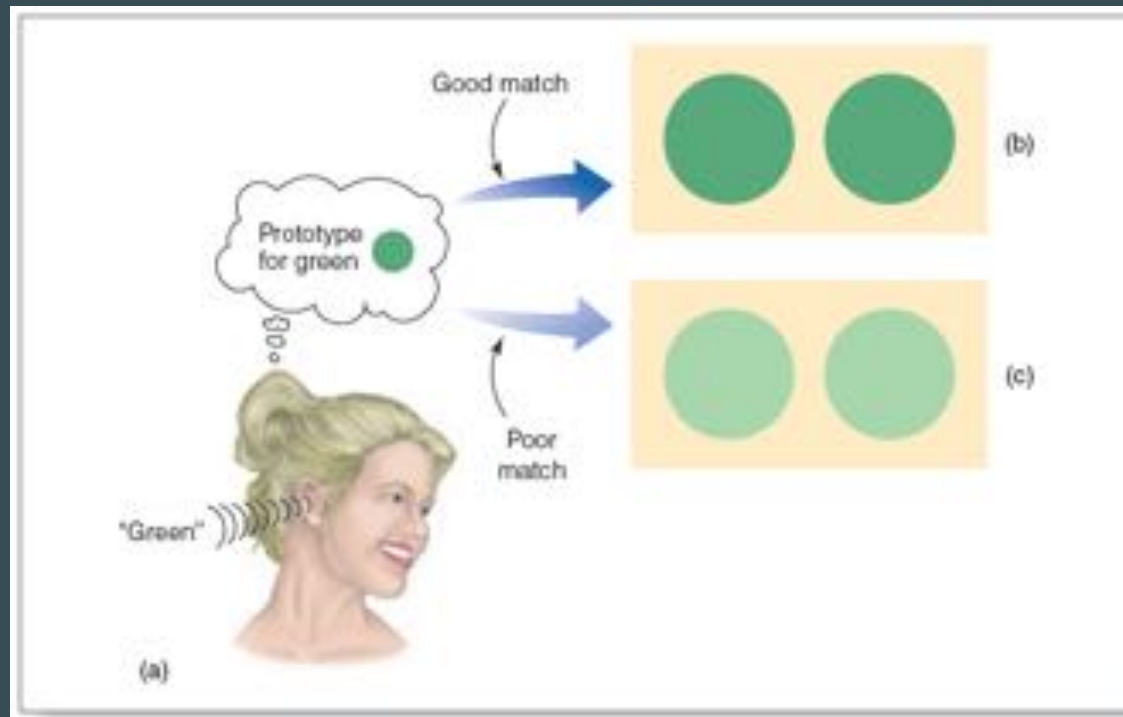
- high typicality members are **verified more rapidly**

Prototype Approach



- high typicality members are more affected by priming

Prototype Approach



- high typicality members are more affected by priming

Behavioral Approaches to Categorization

1. Definitional approach
2. Prototype approach
3. Exemplar approach

Exemplar Approach

Exemplar approach: determine category membership by comparing the item to exemplars of the category

- ▶ **exemplar:** previously encountered member of a category

Exemplar Approach

- categories are defined by **multiple examples of actual category members**, not a single averaged prototype



exemplars



prototype

Exemplar Approach

- categories are defined by **multiple examples of actual category members**, not a single averaged prototype

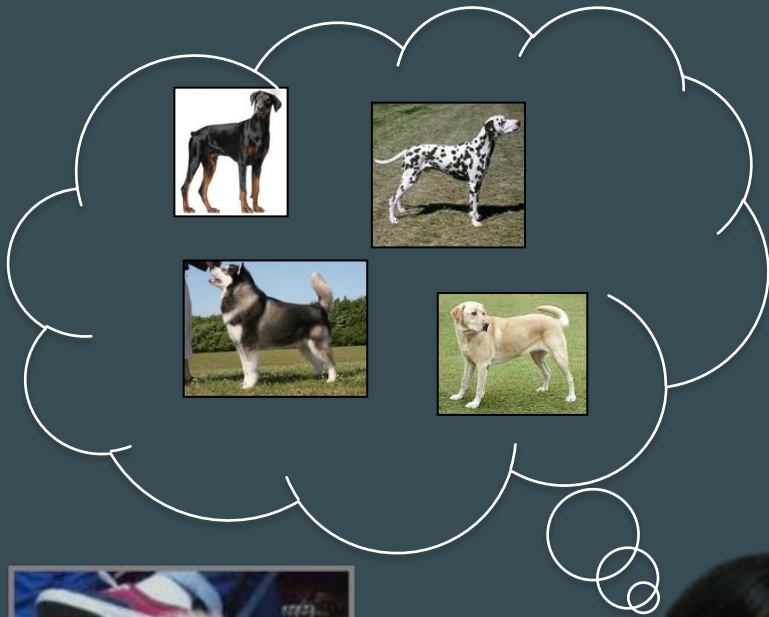


exemplars



president?

Exemplar Approach



What is this?



Exemplar Approach

- works better for smaller categories



Which Approach is Better?

- ▶ we likely use a combination of prototypes and exemplars to categorize things in everyday life



Real Life Implications

Which is the best looking fish?



A



B



C



D

Real Life Implications



Case of Amadou Diallo

- Matched description of serial rapist
- As cops approached him, reached into pocket to pull out his wallet
- Mistaken officer yelled "GUN!"
- Police fired 41 times
- Diallo was innocent and did not have a weapon